

25. (New) The process of Claim 24, wherein said processing quality hydrogen comprises between about 80% to 90% of the quantity of said first use hydrogen introduced in said reactor.

26. (New) The process of Claim 24, wherein the sufficient supplied energy comprises an RF low frequency power energy level of between about 0.318 watt/cm² to about 3.18 watts/cm².

27. (New) The process of Claim 24, wherein said reactor comprises a tapered outer shell surrounding a tapered susceptor.

28. (New) The process of Claim 24, wherein said vapor-phase chemicals comprise gases selected from the group consisting of NH₃, N₂O, SiF₄, SiH₄, TiCl₄, N₂, Ar, HCl, and SiCl₄.

REMARKS

Claims 1-7 and 16-28 are now pending. Claims 1 and 3-5 have been amended. Claims 16-28 have been added with no new matter being added thereby. Applicant requests reconsideration and reexamination of the pending claims.

Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Carson (USPN 4,476,094). Claims 2, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carson in view of Gadgil (USPN 5,284,519). Applicant overcomes the rejections as follows.

Claim 1 sets forth, *inter alia*, "separating a second gas from said exhausted gases; purifying said second gas to generate a third gas." In the present invention, vapor-phase chemicals including a first gas are supplied to the reactor as needed to perform a process function. After the reaction, exhausted gases are routed through a scrubber, which is used to separate the "second gas" from the other "exhausted gases." The "second gas" is then pumped through a purifier, which cleans the second gas making the third gas once again deliverable into the reactor.

Applicant could find no teaching or suggestion in Carson, which discloses purifying a second gas into a third gas.

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Instead, Carson discloses a "gas-liquid separator 14 where [the effluent stream] separates into two streams-a liquid product stream which flows out of the hydrocarbon processing unit through pipeline 15 and a hydrogen and hydrocarbon vapor stream...." (Carson, col. 3, lines 65-68 and col. 4, lines 1-2) There is no teaching or suggestion in Carson that either stream, liquid or vapor, is purified in the separator or in any other part of the system.

Further, Carson teaches away from Applicant's Claim 1, since Carson concedes that "some light hydrocarbons enter the system... as part of the hydrogen feed stream, which is not pure hydrogen...." (Carson, col. 4, lines 27-29) It is clear from FIG. 1, that Carson does not disclose requiring that the hydrogen be purified prior or after reaching the reactor.

Moreover, Claim 1 sets forth that the "second gas" is returned to the reactor after being purified as a "third gas." Instead, Carson discloses that much of the hydrogen in the system is vented causing "significant hydrogen loss from the system." (Carson, col. 4, lines 46-47)

Accordingly, since Carson does not teach or suggest features of Claim 1, Claim 1 is allowable over the cited references.

Claims 2-7 depend from Claim 1 and are allowable for at least the same reasons as Claim 1 as well as for the novel features which they add.

For example, Claim 2 sets forth the reaction comprising "depositing a thin film layer on a substrate positioned in said reactor." As the Examiner has indicated, Carson "fails to teach the hydrogen recycle process with thin film deposition." (Office Action, dated September 18, 2002, p. 3) Applicant submits that Gadgil fails to cure this deficiency, since Gadgil (nor Carson) teaches or suggests the combination of the references, which would be required to arrive at Applicant's invention. Accordingly, Claim 2 is allowable over the combined references.

Claims 16-28 have been added to more completely claim the subject matter of the present invention. No new matter has been added. Support for each of the new claims can be found through the specification and figures. Accordingly, for at least the reasons recited above with regard to Claims 1-7, Claims 16-28 are allowable over the cited references.

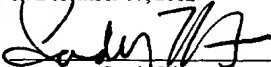
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CONCLUSION

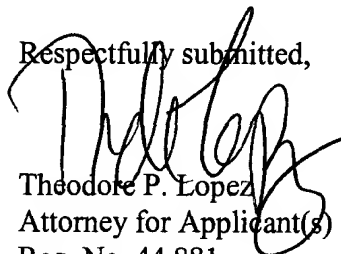
For the above reasons, pending Claims 1-7 and 16-28 are now in condition for allowance and allowance of the application is hereby solicited. If the Examiner has any questions or concerns, the Examiner is hereby requested to telephone Applicant's Attorney at (949) 752-7040.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on December 17, 2002.


Sandy Kim

December 17, 2002
Date of Signature

Respectfully submitted,


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ATTACHMENT A

1. (Amended) A process for recycling a vapor-phase chemical comprising:
introducing vapor-phase chemicals including a first gas into a reactor with sufficient
supplied energy to cause a first reaction in said reactor;
exhausting gases from said reactor resulting from said reaction;
separating a second [first] gas from said exhausted gases;
purifying said second [first] gas to generate a third gas; and thereafter
introducing said third [first] gas into said reactor along with said vapor-phase
chemicals including said first gas into said reactor with sufficient supplied energy to cause a
second reaction in said reactor.
3. (Amended) The process of Claim 1, wherein said first gas comprises pure H₂.
4. (Amended) The process of Claim 1, wherein said **[vapor-phase chemicals]**
second gas comprises non-purified H₂.
5. (Amended) The process of Claim 1 **[4]**, wherein said third [first] gas
comprises between about 80% to 90% of the quantity of said pure H₂ introduced in said
reactor.

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